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I.—WORD-ENDS AND PAUSES IN THE HEXAMETER.

In an important article in *AJP.* XL, pp. 343-372, Professor Bassett has discussed the doctrine of caesura among the ancients. He shows that our traditional view of the matter rests upon a combination of several originally distinct theories. Professor Bassett discusses three of these, which he denominates the metric theory, the rhythmic theory, and the rhetorical theory. At first the metric theory had two forms, which it will be convenient to separate.

(1) Some metrician observed that the hexameter contains several shorter dactylic measures, namely, the trimeter catalectic (∠ ⏔ ∠ ⏔ ∠) and acatalectic (⏔ ∠∠ ⏔ ∠ ⏒) and the tetrameter catalectic (∠ ⏔ ∠ ⏔ ∠ ⏔ ∠) and acatalectic (∠ ⏔ ∠ ⏔ ∠ ⏔ ∠ ⏔), and that one or more such verses can be taken out of almost any one of Homer's lines, for the reason that the close of one or more of these shorter units usually coincides with the end of a word. The term τομή (Latin *caesura*) was originally applied to the shorter metric unit contained within the hexameter, but it was afterwards used of the close of that unit.

(2) Varro observed that the fifth half-foot always (*omnimodo*) closed a word, and we are told that certain unnamed metricians held that only the first two and the last two feet of the hexameter might consist of single whole words. The theory has been modified and interpreted by modern scholars as follows (to abridge Professor Bassett's statement, pp. 370 ff.). Since the hexameter has a somewhat rigid metrical scheme, the poets were at considerable pains to avoid monotony of rhythm. Among the devices employed was such an arrangement of words that

the pauses at the ends of the words should not accentuate the metrical divisions. It was not possible to avoid altogether the coincidence of a word-end with the close of a foot, and scarcely desirable, since variety was the great need of the hexameter; but such coincidence was rather carefully avoided at the middle of the verse to prevent the line from breaking apart into two trimeters. This latter point, I may add, has been emphasized by some scholars; Monro, for example, in the introduction to his edition of the *Iliad* (p. lxxiv), states, as one of the two chief rules of the Homeric hexameter, that "the third foot must not end a word."

(3) Students of rhythmic structure seem to have held that each hexameter contained two *cola* (Bassett, p. 355).

(4) The rhetoricians observed that the rhetorical units combine with the metrical units in various ways. They sometimes correspond with the verse, sometimes they are longer, sometimes they are shorter, and sometimes there are several of them in a single verse. The poets were careful to secure variety by placing the rhetorical pauses at different points. Our clearest authority for this theory before its contamination with other theories is Dionysius of Halicarnassus, *De Comp. Verb.* 26.

The combinations of these theories have been numerous and confusing both in ancient and in modern times. Clear thinking requires their rigid separation. The first and third of them may be very briefly dismissed. The observation that the dactylic hexameter contains certain shorter measures is undoubtedly true, but it is scarcely significant. The doctrine that the hexameter consists of two rhythmic *cola,* on the other hand, is not supported by any noteworthy evidence (Bassett, p. 370). The other two theories require further discussion.

I.

The theory that the coincidence of word-ends with the divisions between feet tended to break the verse into its elements, involves the assumption that the ends of the words were marked by a slight pause. This assumption is sometimes explicitly made,[1] and it is logically necessary for all who hold that word-ends, as such, have significance in the composition of verse. But in modern languages there are no pauses between words within the phrase, or, to be more exact, within the breath-group.[2] It is unlikely that Greek and Latin differed from the modern languages in this respect; and we have besides abundant evidence that they did not have pauses within the breath-groups. A phrase cannot be fused into a compound word unless it is pronounced as one word, and no one will care to assume a pause within a word. Consequently the verbal phrases, which were in Homeric times just giving rise to the compound verbs of later Greek, must have been pronounced without a pause after the prefix when this immediately preceded the verb. The same argument applies to all other stereotyped phrases during the period of their development. Examples are Διόσκουροι, δουρίκτητος, ἑαυτόν, ἐκποδών, καρηκομόωντες, Κυνόσουρα, νεώσοικοι, παλαίφατος, πανῆμαρ, Πελοπόννησος, τρεισκαίδεκα. Particularly important are stereotyped phrases which involve crasis, as γάρ, ἐάν, καλὸς κἀγαθός, οὐδείς, ταὐτά. Significant also are the derivatives of phrases, such as ἀγχιμαχητής, Αἰγοσποταμίτης, αἰειγενέτης, Διοσκουρίτης, ἑκκαιδέκατος, ἐμπυριβήτης, ἐπαίτιος, θεοισεχθρία, νουνεχόντως, πεντεκαιδεκάποδες (*IG.* II Add. 834 b II 20).

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[1] For example, Monro, *Homeric Grammar*, p. 338; Lindsay, *The Captivi of Plautus*, p. 69.

The assimilation of final to initial consonants and other changes of final consonants under the influence of following initials may be understood only if there is no pause between the words. Such is the source of the variants εἰς and ἐς, ἐξ and ἐκ, οὐκ and οὐχ. Inscriptions and papyri have countless instances of the assimilation of a final consonant of the article and of certain prepositions, and occasionally of other words. The following are merely illustrative: ἐὰμ βούληται *P. Rev. L.* 41. 17, ἐγ Λίνδου *IG.* I 259. 9, ἐχ θε̄το̂ν I 31 B 9, *h*ὲκ ποδο̂ν I 322 a 67, ἓγγ δακτύλων, II Add. 834 b II 11, ἐμ Πηλουσίῳ *P. Rev. L.* 52. 18, ἒπὰγ γάρ *P. Eud.* 15. 8, *h*ιερο̂γ χρε̄μάτο̄ν *IG.* I 188. 2, κατ' ἀλήθεαμ πλημμελουμένοις *P. Par.* 63. 13. 10, Κροκοδίλωμ πόλει *P. Petr.*^{2}

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[2] German is no exception to the rule, although elementary teachers of that language sometimes contrast it with French and English in precisely this respect. Such a phrase as *Guten Abend* does indeed separate the final consonant of the first word from the first vowel of the second; but the separation is due solely to the unwritten initial consonant (the glottal plosive) of all German words whose first written letter is a vowel.

21 (a) 2. 7, μὲμ φσυχάς *IG.* I 442. 5, νῦμ μέν I Suppl. a 27 a 48, ὅταμ πέμπῃ II 86. 24, οὐθὲμ πῆμα *P. Par.* 2. 3. 9, οὖμ ποιήσεις *P. Petr.* II 19 (2) 2, πλὴγ γε̂ς *IG.* I Suppl. a 61 a 16, τὲμ πόλιν I 55 c 3, τὸγ κήρυκα II 61. 9, τὸμ παῖδα *P. Petr.* I 14. 17, ὧγ χρή I (1B) 26.

It is well known that the phonetically imperceptible word-division after the English indefinite article has led to incorrect divisions such as *an adder* (German *Natter*), and *a nickname* (properly *eke-name*). Similar to these forms are οὕνεκα from such phrases as ἐκείνοὕνεκα, ἅττα from ὁποῖά ττα, etc., and Modern Greek τὸ νῶμον from τὸν ὦμον.

The clearest evidence of all is furnished by the phenomena of crasis, elision, and semi-elision. Since all of these occur in verse and the last-mentioned two are particularly common in heroic verse, they prove that there need be no pauses at word-ends in the dactylic hexameter. Scarcely less important is the treatment of final syllables with short vowels. Such a word as πόλιν has a long final syllable if the next word begins with a consonant; and even such a word as τά is long if the next word begins with two consonants.

The evidence for Latin is similar. A number of the stereotyped phrases have been discussed by Sturtevant and Kent, *TAPA.* XLVI pp. 129 ff. Others are *adhuc, admodum, antequam, comminus, denuo, dummodo, duodecim, duodeviginti, etiam, interea, necnon, nequis, nescio, nonnulli, numquis, obviam, posthac, postquam, priusquam, proconsule, propterea, prospere, quamvis, quasi, quilibet, quomodo, quoniam, sacrosanctus, sedulo, siquidem, siquis, triumvir.* There are a few derivatives of phrases, such as *abecedarius, antelucanus, antemeridianus, duodecimus, duodevicesimus, interregnum, interrex, obvius, proconsularis, profanus, prosperus, triumviratus.*

That several of the above phrases were pronounced under a single main accent, is shown by phonetic changes of the unaccented syllables (*comminus, denuo, sedulo*). The accentuation of many phrases, including several already mentioned, is shown by the incidence of the ictus in Plautus and Terence; e. g., *intér se, intér vos, apúd me, proptér me, malám rem* (see Lindsay, *Latin Language,* pp. 168 ff., *The Captivi of Plautus,* pp. 357 ff.).

Cogent evidence is afforded by the iambic shortening of initial syllables after short final syllables, e. g., *quís hŭc, út haĕc, quíd ĕxprobras, úb(i) ăccubes.*

The phenomena of syncope of final vowels within a phrase (*ac, nec, dein*), of aphaeresis (*amatu's, amatust, amatumst*), of elision and semi-elision[3] constitute the clearest proof that there was no pause within a breath-group in Latin.

Yet the word-ends are very unevenly distributed in the hexameter, and some explanation must be substituted for the old one, if that is to be rejected. Table I below shows the frequency of word-ends in the sixteen possible positions in the first 500 lines of the *Iliad* and of the *Aeneid.* The figures in the top line indicate the six feet, and the letters in the next line indicate the three possible positions of a word-end in each foot (*a* = after the first syllable, *b* = after the first short syllable, *c* = the end of the foot). In making the count the word-division commonly denoted in printed texts has been followed, except that Greek enclitics have been reckoned as parts of the words to which they are appended.

A glance at the table shows that current theory is out of harmony with the facts. Monro's rule, quoted above, that the third foot must not end with a word is violated by 21.6 per cent of the Homeric verses studied and by 15.6 per cent of the Vergilian. In fact one should not speak of an avoidance of word-ends at the end of any foot in the *Iliad.* It is true that coincidence between the end of words and of feet is somewhat less common in the *Aeneid* in the second, third, and fourth feet; perhaps it is no accident that all evidence more ancient than Eustathius for the avoidance of such coincidence is Roman.[4] Nevertheless, even in Vergil words end at 2*b* and 3*b* less often than at 2*c* and 3*c*, while words end at 4*b* less than one thirteenth as often as at 4*c*; no explanation of the position of word-ends in Vergil can be satisfactory if it neglects these facts.

The differences between the *Iliad* and the *Aeneid* are more

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[3] See especially Sommer, *Handbuch der lat. Laut- und Formenlehre*², pp. 290 ff., and Sturtevant and Kent, *op. cit.*

[4] See Bassett, *op. cit.*, p. 368, who, however, feels certain that the *παλαιοί*, whom Eustathius cites, were Greeks. Is it certain that they did not use Roman sources?

TABLE I.

POSITION OF WORD-ENDS IN THE FIRST 500 VERSES OF ILIAD AND AENEID.

Feet	1			2			3		
Place in Foot	*a*	*b*	*c*	*a*	*b*	*c*	*a*	*b*	*c*
% of Vss. of Iliad.	35.5	31.4	41.0	60.6	16.4	22.4	44.6	60.6	21.6
% of Vss. of Aeneid.	34.0	16.2	44.6	64.0	16.8	17.0	84.6	11.0	15.6

Feet	4			5			6
Place in Foot	*a*	*b*	*c*	*a*	*b*	*c*	*a*
% of Vss. of Iliad.	47.4	2.2	62.4	24.4	49.8	24.8	1.2
% of Vss. of Aeneid.	78.2	3.8	52.4	2.0	46.6	60.4	1.8

numerous and striking than their points of resemblance. The percentages are nearly alike at 1*a*, 1*c*, 2*a*, 2*b*, 4*b*, 5*b*, and 6*a*, while they differ, in some cases very much indeed, in the nine other positions. The differences are most numerous and extensive in the third and fourth feet—the feet which students of caesura consider most important. Probably, therefore, the position of the word-ends in the verse is a function not so much of the verse, which is the same in both poems, as of the language, in which the two poems differ.

At any rate we must study the two sets of figures separately. Since the second one presents the greater number of characteristic features, we have a better chance of finding a satisfactory explanation of it, and consequently we shall start with that.

As to the first four feet of the *Aeneid,* the prominent features are the frequency of word-ends at 2*a*, 3*a*, and 4*a*, and their rarity at 3*b* and 4*b*. In the last two feet the relative frequencies are reversed; word-ends are extremely rare at 5*a* and 6*a*, but common at 5*b*.

All of these facts are easily explained by the effort which the Roman dactylic poets made to secure coincidence of accent and ictus in the last two feet and clash of accent and ictus in the first four feet (as I have shown in *CP.* XIV, pp. 373-385). For a word-end at *a* requires clash of accent and ictus, unless it is preceded by an accented monosyllable, and these are very rare in Latin. Since most Latin words are dissyllables or trisyllables, the placing of word-ends at *a,* as in the first four feet, involves the rarity of word-ends at *b* and *c* in the same and the neighboring feet, while the avoidance of word-ends at *a,* as in the last two feet, leaves many word-ends for *b* and *c.* The frequency of word-ends at 4*c* is therefore due in part to the avoidance of them at 5*a,* where they would cause clash of accent and ictus in the fifth foot, and in part to the avoidance of word-ends at 4*b,* where they would cause harmony of accent and ictus in the fourth foot.

There are, of course, other factors in the problem. The comparative rarity of word-ends at *b* in all feet except the fifth is in part due to the fact that words cannot end at *b* if the foot is a spondee. In the fifth foot word-ends are somewhat rarer at *b* than at *c* for two reasons. (1) A word-end at 5*b* must be followed either by a short monosyllable or by a word of the rhythm ⏑ – – (monosyllabic verse-finals are so rare that they need not be taken into account). Both kinds of words are rare in Latin. Monosyllables constitute only about 19 per cent of Vergil's words, and a very large majority of Latin monosyllables are long; while trisyllables with iambic beginning constitute only about 6 per cent of Vergil's words.[5] It is interesting to note that Vergil favored the latter verse-final as much as his resources allowed; in the last two feet words of this rhythm constitute 18 per cent of all words. (2) The only words that can end at *b* are short monosyllables (whose rarity has just been noted), and polysyllables ending in a trochee. I have no statistics as to the frequency of words with this cadence in Vergil's vocabulary; but our table shows that such words are uncommon in the interior of the verse (they are possible only if they end at *b*), and a glance at the text will show that they are in a minority at the end of the verse, if one excludes words with a short vowel before a single consonant, which would usually "make position" in the interior of the verse.

The position of word-ends in Homer cannot be explained with such completeness; but there is less to explain, since the extreme variation is far less. This fact indicates that Homeric usage is not controlled by any one factor of such strength as the Latin stress accent.

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[5] See *CP.* XIV, pp. 375-378.

There remain such factors as had a minor effect upon the position of word-ends in Vergil. The fact that words cannot end at *b* when the foot is a spondee explains the comparative rarity of word-ends at 1*b* and 2*b*, and does a little toward explaining the almost total absence of word-ends at 4*b*. It seems likely that the length and rhythmic character of the available words was of prime importance in fixing the position of the word-ends in Homer. The matter is so complicated that it can be satisfactorily studied only at the ends of the verse. Since the first foot presents merely an average number of word-ends in each of the three places, with the anticipated reduction in the second, we shall make our investigation at the other end of the verse.

We should expect each type of word which is possible at the end of the line to appear there with the same relative frequency as in the verse as a whole. In Table II the first column exhibits the various types of words which are possible at the end of the verse, and the second column records the proportion of words of each type in 3500 words of *Iliad* I and II.[6] But before we base a prediction upon these numbers, we must make three corrections. There is a pause in the sense at the close of at least two thirds of Homer's lines, and no line is closed by a word which stands in unusually close syntactic relation to what follows, such as *καί*, prepositions, the article, and relative pronouns and adverbs. Now these words which cannot stand at the end of a line are nearly all monosyllables and dissyllables, and furthermore there are many other monosyllables and dissyllables which usually stand at or near the beginning of a sentence or clause, and so can but rarely stand at the end of a line. The poet, then, will be found to use fewer monosyllables and dissyllables at the end of the line than the numbers in Column II suggest.

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[6] In compiling these statistics I have reckoned enclitics with the words to which they are appended (’Ατρεΐδης τε = – ⏑ ⏑ – ⏑), and I have counted elided syllables (μυρί’ = – ⏑ ⏑, δ’ = ⏑), but I have recorded words with synizesis in the form which they show in the verse (Πηληιάδεω = – – ⏑ ⏑ –).

TABLE II.

VERSE-FINALS IN THE ILIAD.

Possible words that may end verse. I	Proportion in verse as a whole II	Less words unlikely as verse-finals III	Proportion to 37.35 IV	With correction for spondaic verses V	With correction for rhythmic character of preceding words VI	Actual proportion in lines studied VII
⏒	20.11	.68	1.82	1.82	.98	.9
– ⏒	22.29	14.00	37.48	37.48	26.50	26.2
⏑ – ⏒	8.29	8.29	22.20	29.08	30.62	43.0
– – ⏒	4.69	4.69	12.56	3.27	1.76	.9
⏑ ⏑ – ⏒	5.66	5.66	15.15	19.85	26.29	16.4
– – – ⏒	1.46	1.46	3.91	1.02	.72	3.4
– ⏑ ⏑ – ⏒	1.97	1.97	5.27	6.90	12.44	8.7
⏑ – – – ⏒	.43	.43	1.15	.30	.31	.1
⏑ ⏑ – – – ⏒	.11	.11	.29	.08	.10	.2
– – ⏑ ⏑ – ⏒	.03	.03	.08	.10	.13	.1
⏑ ⏑ – ⏑ ⏑ – ⏒	.03	.03	.08	.10	.13	.1
		37.35				

In order to determine the amount of the necessary correction, I have counted the parts of speech at the ends of 1000 lines. I find that 94.5 per cent of the line-finals are either nouns, verbs or adjectives; adverbs and pronouns are so rare that they may safely be neglected. Now 3.4 per cent of Homer's monosyllables and 62.8 per cent of his dissyllables with long initial syllable are verbs, nouns, or adjectives. In Column III, therefore, we substitute for the first two numbers of Column II respectively 3.4 and 62.8 per cent of those numbers.

Since the total of the percentages in Column III is only 37.35, we must reduce them to a denominator of 100 for purposes of comparison. This is done in Column IV.

Some types of words are possible verse-finals only if the fifth foot is a dactyl, and others only if the fifth foot is a spondee. Since Homer favored the dactyl in the fifth foot, we shall expect to find more of the words which require a dactyl than the numbers in Column IV indicate, and fewer of the words which require a spondee. Since spondaic verses occur at the rate of about 4.6 per 100, we must distribute 4.6 among the word-types which require spondaic verses in proportion to the frequency of these word-types. It was never necessary for the poet to place a fifth spondee before a verse-final of the rhythm ⏒ or – ⏒, and, as a matter of fact, he very rarely did so. We may therefore assign all of the 4.6 to the rhythmic types – – ⏒, – – – ⏒, ⏑ – – – ⏒, and ⏑ ⏑ – – – ⏒ (– – – – ⏒,– ⏑ ⏑ – – – ⏒, etc. do not occur in the lines studied). Since words of these types aggregate 17.91 per cent of Homeric words capable of standing at the end of a line, we must multiply the number which stands in Column IV opposite each of them by $\frac{4.6}{17.91} = .26$.

The remainder of the 17.91 per cent, which Column IV assigned to the verse-finals requiring spondaic lines, must be distributed among the rhythmic types which require a dactyl in the fifth foot, in proportion to the frequency of these several types. That is, we must add to each number in Column IV opposite ⏑ – ⏒, ⏑ ⏑ – ⏒, – ⏑ ⏑ – ⏒, – – ⏑ ⏑ – ⏒, or ⏑ ⏑ – ⏑ ⏑ – ⏒, an amount equal to the same number times $\frac{17.91-4.6}{42.78} = .31$. The results of these operations appear in Column V.

Again, the choice of the final word of the line must have depended in part upon the ease with which another word could be fitted in before it. Table III[7] exhibits the proportion of Homer's words of each of the rhythmic types possible before each of the possible types of verse-finals. Each block is headed by an indication of the rhythmic type or types of verse-finals treated therein. The first columns of the several blocks list the rhythmic types which can stand before such verse-finals. The second columns show what proportion of all Homeric words belong to the several rhythmic types of the first columns. The third columns show what proportion the numbers in the second columns constitute of the totals of the second columns.

The totals of the second columns indicate the proportion of Homeric words which can stand before the several types of

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[7] In making this computation I have reckoned words at the end of the line in their normal rhythmic form (*κύνεσσιν* = ⏑ – ⏑, *βουλή* = – –, *μάχεσθαι* = ⏑ – –, *ἄποινα* = ⏑ – ⏑), while other words have been counted in the rhythmic value which they have in each occurrence (*μυρί'* = – ⏑, *τὰ* before *πρῶτα* = –, *τίς τ'* = –, *χρύσεω* in line 15 = – ⏑). Consequently elided monosyllables have not been counted at all.

TABLE III.

Rhythmic Types Possible before the Possible Verse-Finals.

	⏓ – – ⏓			– ⏓ – – – ⏓			⏑ – ⏓ ⏑ – – – ⏓			⏑ ⏑ – ⏓ ⏑ ⏑ – – – ⏓ – – ⏑ ⏑ – ⏓ ⏑ ⏑ – ⏑ ⏑ – ⏓			– ⏑ ⏑ – ⏓
I	II	III	I	II	III	I	II	III	I	II	III	I	II
–	15.3	50.5	⏑	6.8	29.7	⏑	6.8	19.9	–	15.3	35.7	⏑	6.8
⏑ –	6.8	22.4	⏑ ⏑	7.6	33.2	– ⏑	13.2	38.7	⏑ –	6.8	15.9	–	15.3
⏑ ⏑ –	3.5	11.5	– ⏑ ⏑	4.1	17.9	⏑ – ⏑	4.5	13.2	– –	9.1	21.2	⏑ ⏑	7.6
– ⏑ ⏑ –	3.3	10.9	⏑ – ⏑ ⏑	2.1	9.1	– – ⏑	2.5	7.3	⏑ ⏑ –	3.5	8.2	– –	9.1
⏑ – ⏑ ⏑ –	1.1	3.6	– – ⏑ ⏑	.8	3.5	⏑ ⏑ – ⏑	4.3	12.6	– – –	2.5	5.8	– ⏑ ⏑	4.1
– – ⏑ ⏑ –	.1	.3	⏑ ⏑ – ⏑ ⏑	1.3	5.7	– – – ⏑	.9	2.6	– ⏑ ⏑ –	3.3	7.7	⏑ – –	5.7
⏑ ⏑ – ⏑ ⏑ –	.2	.7	– – – ⏑ ⏑	.1	.4	– ⏑ ⏑ – ⏑	1.2	3.5	⏑ – – –	.5	1.2	– – –	2.5
			⏑ – ⏑ ⏑ – ⏑ ⏑	.1	.4	⏑ – – – ⏑	.4	1.2	– – – –	.4	.9	⏑ – ⏑ ⏑	2.1
						⏑ – ⏑ ⏑ – ⏑	.1	.3	⏑ – ⏑ ⏑ –	1.1	2.6	– – ⏑ ⏑	.8
						– – ⏑ ⏑ – ⏑	.1	.3	– – ⏑ ⏑ –	.1	.2	⏑ ⏑ – –	2.2
						⏑ ⏑ – ⏑ ⏑ – ⏑	.1	.3	⏑ ⏑ – – –	.1	.2	– – – –	.4
									⏑ ⏑ – ⏑ ⏑ –	.2	.5	⏑ ⏑ – ⏑ ⏑	1.3
												– – – ⏑ ⏑	.1
												– ⏑ ⏑ – –	.3
												⏑ – ⏑ ⏑ – ⏑ ⏑	.1
Totals	30.3			22.9			34.1			42.9			58.4
Corrected	17.41			22.9			34.1			42.9			58.4

verse-finals. Evidently the most difficult types of verse-finals to manage are – ⏒ and – – – ⏒ (with the assumption, of course, that they are to be preceded by dactyls). Now, more than half (15.3 out of 30.3) of the words which are possible before ⏒ and – – ⏒ are long monosyllables; and before these the same difficulty would arise as before – ⏒ and – – – ⏒. We must therefore substitute for the total in the first block $30.3 — 15.3 + (15.3 \times .229) = 17.41$. This is done in the last line of Table III.

We now multiply the numbers in Table II, Column V, by the numbers in the last line of Table III, and reduce the results to decimals of their sum. These are the numbers which appear in Table II, Column VI, which may therefore be considered as a prediction of the relative frequency of the several types of verse-finals.

In Column VII of Table II we have their actual proportions in 1000 lines of the *Iliad*. In spite of several striking divergencies, the two columns correspond in several important respects. The types of first, second, third, and fourth frequency are the same in both, and, in both, the four types at the bottom of the table are much less frequent than any others. These correspondencies are enough to show that the rhythmic character of the available words did, in the main, determine the character of the verse-finals.

The divergencies between the two columns are in part due to properties of the rhythmic types which we have not succeeded in measuring. For example, rhythmic types which were convenient at the end of the verse were convenient also in other positions, and so there arose a certain rivalry between the several positions. Column VI of Table II calls for the rhythmic type – ⏑ ⏑ – ⏒ as the final of 12.44 per cent of all verses, or 62 verses out of five hundred. Since there are about 3280 words in five hundred lines, and 1.97 per cent of Homer's words are of the type – ⏑ ⏑ – ⏒, there were available in five hundred lines only about 65 words of this type. Now, the type is convenient at the beginning of the verse (as in I 13, 180, 372), beginning with the second foot (as in I 398, 530), and beginning with the fourth foot (as in I 520, 525). The claims of these positions prevented the final position from receiving its full quota of words of this type. Similar or contrary considerations must apply to other types.

Again, the influence of the common verse-tags can scarcely be measured. It is particularly noteworthy that there are many tags ending with the proper names Ἀθήνη, Ἀπόλλων, Ἀχιλλεύς, Ἀχαιοί, and Ὀδυσσεύς, all of which contribute to the explanation of the troublesome discrepancy in the third line of Table II.

Another factor was the preference for sense-pauses at certain points of the verse, a matter which we shall presently have to study. Since such pauses were rare in the last two feet but favored at the end of the fourth foot, it is not strange that verse-finals of the type – – – ⏒ are more common and those of the type – – ⏒ less common than our statistics would lead us to expect. The same consideration helps to explain the great frequency of lines ending in dissyllable + trisyllable (*τοῖσι δ' ἀνέστη*, etc.)—again a partial explanation of the third line of Table II.

Column VII of Table II gives a satisfactory explanation of the last two numbers for the *Iliad* in Table I. .9 per cent of 1000 lines end in a monosyllable, and 26.2 per cent in a dissyllable, while 1.2 per cent of 500 lines have a word-end at *6a*, and 24.8 per cent have a word-end at *5c*; the two pairs of numbers would be the same if they referred to precisely the same lines. The slight difference between the 43 per cent of lines ending in ⏑ – ⏒ and the 49.8 per cent of lines with a word-end at *5b* is accounted for by the few line-ends such as *μάλα δήν*, and the somewhat more frequent *σὺ Κάλχαν, δὲ μάντις*, etc.

As we recede from the end of the line, the possible combinations rapidly become more numerous; but we should be able to reach an approximately correct result for *5a* and *4c*. The attempt to do this is made in Table IV. The various possible combinations of rhythmic types are indicated at the left (a comma marks the end of a word). The Italic numbers are taken from Table II, Column VII, and represent the actual frequency of the verse-finals. The heavy-faced numbers are taken from the third columns in Table III. At the right we have the frequency of the several combinations, the actual frequency if the number is Italic, if not, the anticipated frequency.

The totals, 36.39 and 49.18, do not correspond very well with the 24.4 and 62.4 of Table I. The disturbing factor is undoubtedly the avoidance of sense pauses at *5a* and *4b* and the preference for sense-pauses at *4c*. As we shall see, from 11 to

15 per cent of the lines of the *Iliad* have punctuation at 4*c*—more than at any other point within the verse. It is safe to say that at least 15 per cent of the lines had a sense-pause here. If we add 15 to 49.18 per cent of 85, the result is 56.8, which falls only a little short of the 62.4 of Table I.

TABLE IV.

Involve Word-Ends at 5*a*.

							Frequency
∪ ∪ – ⏓							*16.40*
– – ⏓							*.90*
∪, ∪ – ⏓	*43.0*	×	.199			=	8.53
∪ ∪, – ⏓	*26.2*	×	.332			=	8.69
∪ ∪ –, ⏓	*.9*	×	.115			=	.10
∪, ∪, – ⏓	*26.2*	×	.297	×	.199	=	1.58
∪, ∪ –, ⏓	*.9*	×	.224	×	.199	=	.04
∪ ∪, –, ⏓	*.9*	×	.505	×	.332	=	.15
Anticipated frequency							36.39

Involve Word-Ends at 4*c*.

							Frequency
– ∪ ∪ – ⏓							*8.70*
– – – ⏓							*3.40*
–, ∪ ∪ – ⏓	*16.4*	×	.357			=	5.85
–, – – ⏓	*.9*	×	.505			=	.45
– ∪, ∪ – ⏓	*43.0*	×	.387			=	16.64
– ∪ ∪, – ⏓	*26.2*	×	.179			=	4.69
– ∪ ∪ –, ⏓	*.9*	×	.109			=	.10
–, ∪, ∪ – ⏓	*43.0*	×	.199	×	.357	=	3.06
–, ∪ ∪, – ⏓	*26.2*	×	.332	×	.357	=	3.11
–, ∪ ∪ –, ⏓	*.9*	×	.115	×	.357	=	.04
– ∪, ∪, – ⏓	*26.2*	×	.297	×	.387	=	2.98
– ∪, – ∪, ⏓	*.9*	×	.224	×	.387	=	.08
– ∪ ∪, –, ⏓	*9.*	×	.505	×	.179	=	.08
Anticipated frequency							49.18

It appears, then, that the position of the word-ends in the *Aeneid*, and presumably in other Latin hexameter verse, is chiefly due to the poet's desire for harmony of accent and ictus in the last two feet and clash of accent and ictus in the first four feet. In the *Iliad* there are several factors, of which we have been able to identify three. (1) The comparative rarity of word-ends after the first short syllable of a foot is largely due to the fact that there is no such point in a spondee. (2) The length and rhythmic character of the available words determined the position of a large proportion of the word-ends, at least in the last two feet. (3) A favored position for a sense-pause tended to have a disproportionately large number of word-ends, and the neighboring positions to have relatively few word-ends.

While there are doubtless other factors in the problem, these are clearly the important ones. At any rate, there is no need to invoke any direct bearing of word-ends within a phrase upon the structure of the verse.

II

There can be no doubt that sense-pauses in Greek and Latin were determined by the same factors as in the modern languages, and so the opinions of modern scholars in this matter may be accepted as having some validity; but there is room for difference of opinion and of practice in regard to the pauses in one's own language, and it is much more difficult to be certain about a foreign language—especially one which is no longer used as a vernacular. It is no wonder, then, that scholars who have believed that there must be a pause in the third foot of the dactylic hexameter have usually succeeded in finding one! If we base statistics upon our own judgment of where pauses are proper, we shall probably find that the facts accord with our prepossessions.

Fortunately, however, classical texts have been punctuated by their editors without reference to a theory of caesura, and a point usually corresponds with a pause. Not all pauses are marked by any current system of punctuation, and so we cannot hope to obtain complete statistics on this basis; but probably the points are distributed through the line in about the same proportion as the pauses. In making the count, only English and American editions have been used,[8] in the belief that the English system of punctuation is less mechanical than some others.

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[8] *Iliad,* ed. Monro and Allen; *Odyssey,* ed. Allen; Hesiod, ed. Paley; Apollonius, ed. Mooney; Theocritus, ed. Kynaston; Theognis, ed. Hudson-Williams; Vergil, ed. Hirtzel; Lucretius, ed. Kelsey; Horace, ed. Morris; Ovid, *Metamorphoses,* Laing's selections; Ovid, elegiac selections in Ramsey. The members of the Classical Proseminar in Columbia University in the spring of 1920 assisted in constructing Table V.

TABLE V.

POINTS PER 100 LINES.

		Il. I, II	*Il.* XXIII, XXIV	*Od.* I-III	Hes., *Theog.*	Hes., *Op.*	Apollonius	Theocritus	Theognis (hexameters)	*Aen.* I, II	*Aen.* XI, XII	*Eclogues*	*Georgics*	Lucretius	Horace, *Sat.*	Ovid, *Met.*	Ovid, elegiacs (hexameters)
1	*a*	.2	1.1	.7	.3	0	.7	1.1	.6	.6	.1	2.2	.8	.7	1.3	.9	1.7
	b	2.0	2.1	3.7	1.4	.7	4.4	1.6	3.0	.7	1.3	1.9	.7	.4	1.1	4.0	2.2
	c	7.6	8.0	8.2	6.0	5.4	7.1	8.3	5.6	6.7	5.8	9.8	5.7	2.6	8.4	9.4	7.0
2	*a*	6.6	5.4	6.3	8.5	8.9	11.1	9.6	6.5	9.6	13.6	8.1	7.0	4.1	10.5	9.4	7.5
	b	.4	.4	.6	.5	.2	0	.9	1.6	.9	1.0	2.1	.6	.7	1.5	.6	0
	c	0	0	.1	.2	0	.1	.5	.4	2.3	.9	.8	.5	.9	3.0	.1	.1
3	*a*	11.3	12.3	10.8	10.0	15.2	7.1	18.0	6.8	13.5	16.2	22.7	8.7	11.3	28.2	36.8	28.3
	b	10.2	11.3	11.2	10.5	7.2	9.1	18.8	17.7	1.0	1.1	5.3	.8	.6	4.3	1.1	.6
	c	0	0	.1	.1	0	0	1.2	0	.6	.7	1.1	.6	.2	1.2	1.3	.4
4	*a*	3.2	4.3	2.4	2.9	6.8	1.5	3.9	5.0	11.2	14.4	11.3	9.3	3.6	11.0	10.1	9.9
	b	0	0	0	0	0	0	0	0	.1	.1	.2	0	.1	.3	.1	.4
	c	11.3	14.7	12.0	8.6	11.2	18.5	27.2	24.0	1.5	2.0	9.9	2.9	2.4	15.4	3.6	3.0
5	*a*	.1	0	0	0	.4	0	.3	.9	.1	0	.1	0	.1	1.5	0	0
	b	.1	.1	.1	0	.1	.1	.8	.9	1.2	1.3	5.1	1.4	1.8	7.5	2.8	2.8
	c	0	0	.3	0	0	0	1.2	.4	.7	.9	4.3	.8	.8	9.2	2.4	2.4
6	*a*	0	0	.1	0	0	0	0	0	0	0	0	0	0	1.0	0	0
	c	66.2	65.9	71.9	64.3	65.8	46.9	63.0	50.1	55.5	51.0	75.6	69.8	53.8	49.8	67.4	77.3
Totals		119.2	125.6	128.5	113.3	121.9	106.6	156.4	123.5	106.2	110.4	160.5	109.6	84.1	155.2	150.0	143.6

Table V shows the number of points (of all kinds except [ ] and < >) per 100 lines in each of the seventeen possible positions, and in eight passages of Greek and as many of Latin. The figures in each column are based upon the study of 1,000 lines of text, except that less than that is available for Hesiod's *Works and Days,* for Theognis' hexameters, and for Vergil's *Eclogues.*

It appears, as was to be expected, that some of these texts have much more punctuation than others. Poems of colloquial tone, particularly if they contain much conversation, inevitably have a great deal of punctuation. Furthermore, some editors use many points and others comparatively few. Since neither kind of variation is significant for our purpose, they have both been eliminated in Table VI by reducing all the columns to a denominator of 100.

Here, as in our study of the word-ends, the differences between the two languages are more numerous and striking than the likenesses. In both languages about one-half of all pauses come at the end of the line; this was undoubtedly a cardinal element of poetic technique. A corollary of this is the avoidance of pauses at 6*a;* the only poet studied (Horace) that has an appreciable number of pauses at 6*a,* is the one who has the smallest proportion of pauses at the end of the line. In both languages there are more pauses in the third foot than in any other, while the fourth foot stands second. This also is in large part a corollary of the fondness for pauses at the end of the line; since the sixth foot is dissyllabic, the middle of the line falls late in the third foot, and the sense-pauses must tend to cluster there. Nevertheless, the differences in detail between Greek and Latin are particularly striking in these feet, and so the treatment of pauses in them can scarcely be ascribed directly to a poetic technique which was common to the writers of both languages. Another point of resemblance between the Greek and Latin hexameters is the avoidance of sense-pauses at 4*b* and, in a lesser degree, at 5*a.* I have no explanation to offer for these last peculiarities; just for that reason I suspect that they may have metrical significance.

The Greek half of Table VI shows some further features which Latin hexameters do not share. The favorite position for a pause within the line is 4*c;* while, after 4*b* and 6*a,* pauses are

TABLE VI.

PROPORTION OF ALL POINTS IN EACH POSITION.

		Il. I, II	*Il.* XXIII, XXIV	*Od.* I-III	Hes., *Theog.*	Hes., *Op.*	Apollonius	Theocritus	Theognis (hexameters)	*Aen.* I, II	*Aen.* XI, XII	*Eclogues*	*Georgics*	Lucretius	Horace, *Sat.*	Ovid, *Met.*	Ovid, elegiacs (hexameters)
1	*a*	.2	.9	.5	.3	0	.7	.7	.5	.6	.1	1.4	.7	.8	.8	.6	1.2
	b	1.7	1.7	2.9	1.2	.6	4.1	1.0	2.4	.7	1.2	1.2	.6	.5	.7	2.7	1.5
	c	6.4	6.4	6.4	5.3	4.4	6.7	5.3	4.5	6.3	5.3	6.1	5.2	3.1	5.4	6.3	4.8
2	*a*	5.5	4.3	4.9	7.5	7.3	10.4	6.1	5.3	9.0	12.3	5.0	6.4	4.8	6.8	6.3	5.2
	b	.3	.3	.5	.4	.2	0	.6	1.3	.8	.9	1.3	.5	.8	1.0	.4	0
	c	0	0	.1	.2	0	.1	.3	.3	2.2	.8	.5	.5	1.1	1.9	.1	.1
3	*a*	9.5	9.8	8.4	8.8	12.5	6.7	11.5	5.5	12.7	14.7	14.1	7.9	13.4	18.2	24.5	19.7
	b	8.7	9.0	8.7	9.3	5.9	8.5	12.0	14.3	.9	1.0	3.3	.7	.7	2.8	.7	.4
	c	0	0	.1	.1	0	0	.8	0	.6	.6	.7	.5	.2	.8	.9	.3
4	*a*	2.7	3.4	1.9	2.6	5.6	1.4	2.5	4.0	10.5	13.0	7.0	8.6	4.3	7.1	6.7	6.9
	b	0	0	0	0	0	0	0	0	.1	.1	.1	0	.1	.2	.1	.3
	c	9.5	11.7	9.3	7.6	9.2	17.3	17.4	19.5	1.4	1.8	6.2	2.7	2.9	9.9	2.4	2.1
5	*a*	.1	0	0	0	.3	0	.2	.7	.1	0	.1	0	.1	1.0	0	0
	b	.1	.1	.1	0	.1	.1	.5	.7	1.1	1.2	3.2	1.3	2.1	4.8	1.9	1.9
	c	0	0	.2	0	0	0	.8	.3	.7	.8	2.7	.7	.9	5.9	1.6	1.7
6	*a*	0	0	.1	0	0	0	0	0	0	0	0	0	0	.6	0	0
	c	55.5	52.5	56.0	56.8	54.0	44.0	40.3	40.8	52.3	46.2	47.1	63.7	64.0	32.1	44.9	53.8

most carefully avoided at *2c*, and *3c*, and almost as carefully at *5c*. These facts remind one of the theory (discussed above, pp. 289 ff.) that word-ends were avoided at the ends of certain feet to avoid separating the line into smaller units. We had to reject the theory on the ground that word-ends are not phonetically perceptible; but there are inevitable pauses at the ends of the breath-groups, and these might well break the line into shorter units.

It seems probable, then, that the Greek poets were careful to mark the end of most hexameters by a pause; but, to avoid monotony, they occasionally obscured the metrical units (1) by an additional pause at the end of the fourth foot, or (2) by a pause at the end of the fourth foot without one at the end of the verse. The first device had the effect of a tetrameter followed by a dimeter, as in *Il.* I 116:

ἀλλὰ καὶ ὣς ἐθέλω δόμεναι πάλιν, εἰ τό γ' ἄμεινον.

The second device went even further, since it left the verse-end quite unmarked, and substituted for the hexameter various incommensurate groups of units (tetrameter followed by trimeter, or by catalectic pentameter, or by some other unit), as in *Il.* II 76 f.:

Ἦ τοι ὅ γ' ὣς εἰπὼν κατ' ἄρ' ἕζετο, τοῖσι δ' ἀνέστη
Νέστωρ,

and in *Il.* I 68 f.:

Ἦ τοι ὅ γ' ὣς εἰπὼν κατ' ἄρ' ἕζετο, τοῖσι δ' ἀνέστη
Κάλχας Θεστορίδης.

Why this particular place of breaking the line was favored, and the breaks at *2c*, *3c*, and *5c* disfavored, I cannot say. If we knew that the hexameter line had developed out of a couplet consisting of tetrameter and dimeter, we might regard the practice as traditional, but there is no other evidence for such an origin.[9]

Whatever the explanation may be, we must conclude that the technique of the Greek hexameter involved (1) a pause at the end of most lines, (2) frequent pauses at *4c*, (3) strict avoidance of pauses at *4b* and *6a*, and (4) less rigorous avoidance of pauses at *2c*, *3c*, and throughout the fifth foot.

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[9] Witte's chain of hypotheses in *Glotta* IV, 1 ff. is not evidence.

The Latin half of Table VI shows many differences from the Greek. They fall into two groups. Pauses are not rigorously excluded from any positions in the verse except 4*b* and 6*a*, and a few pauses are found even in these two places. Pauses are not uncommon at 2*c* and 3*c*, and they are not avoided at all at 5*b* and 5*c*. All these differences point toward a less rigorous technique; they were perhaps indirectly due to the added difficulty which the Roman poets faced in the need to secure harmony of accent and ictus in the last two feet of the verse and clash of accent and ictus in the other four.

This latter requirement of the Latin hexameter is directly responsible for the second group of differences between the two halves of Table VI. In the first four feet we find in the Roman poets more pauses than in the Greek poets at 3*a* and 4*a*, positions which involve an ictus on the ultima, and fewer pauses at 3*b* and 4*c*, positions which usually require an ictus on the accented syllable. In the last two feet, on the contrary, the Roman poets have more pauses than the Greeks at 5*b* and 5*c*, positions which usually involve an ictus on the accented syllable.

It appears, then, that of the four theories which gave rise to the doctrine of caesura, the only one that is both valid and important is the theory of rhetorical pauses, which modern scholars would prefer to denominate sense-pauses, or, if thinking of phonetics as one must in the treatment of verse, ends of breath-groups. These were manipulated for the double purpose of marking the chief metrical unit, the verse, and of introducing variety by occasionally obscuring the unit. The Greek poets were particularly fond of using the break after the fourth foot for the latter purpose, while they avoided ending a breath-group in certain other places.

Nearly all deviations of Roman practice from Greek can be explained as due to the effort of the Roman poets to secure conflict of accent and ictus in the first four feet and harmony of accent and ictus in the last two feet. This fact confirms my demonstration, referred to above, that there was such an effort on the part of the Roman dactylic poets.

If the term caesura is to be retained at all, it should be used only of regular metrical pauses, such as occur in the so-called dactylic pentameter and in Asclepiadean verses.

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